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METHODS FOR INTELLIGENTLY ORGANISING GLOBAL SATELLITE DATA PROCESSING

Abstract

The increasing demand for space imagery and advancements in technology have given rise to numerous high-quality Earth remote sensing systems. These systems are capable of generating a vast amount of information, which is now accessible to a wide range of users. To make the most effective use of this data, it is crucial to develop new approaches and methods for working with satellite data. These approaches should not only facilitate the search and acquisition of information but also enable the intelligent organization and analysis of data using distributed computing resources. One potential approach to enhance the utilization of satellite data is the integration of artificial intelligence algorithms. In summary, the growing demand for space imagery and technological advancements have led to the emergence of high-quality Earth remote sensing systems. To effectively utilize the increasing amount of available satellite data, it is necessary to develop new approaches and methods. New methods of working with very large distributed archives of satellite data using developed intelligent machine interfaces based on web technologies were suggested. A new data model providing maintenance of distributed storage systems and aimed at dynamic creation of complex virtual information products at the moment of their demand on the basis of stored ones was considered as a basis for the development of these methods. This model allowed us to significantly optimise storage systems. This included a significant reduction in the volume of archives and unification of the scheme of working with heterogeneous data. The developed model, methods and software infrastructure based on it significantly increase the efficiency of work with remote sensing information, as users are able not only to search and select the required data sets, but also to process and analyse them using distributed computing resources of centres providing storage and satellite information. The results obtained make it possible to fundamentally change the approaches to handling satellite information in real-time mode, to significantly simplify the organisation of its use and, as a consequence, to expand the area of application of remote sensing data. The proposed methods and software infrastructure to build intelligent machine interfaces of distributed interactive satellite data processing systems will allow the user to perform high resolution remote sensing data processing procedures on large distributed archives without creating local copies of the data, using the capacities of the archives themselves and providing sophisticated tools to process and analyse them.